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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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04/30/2001

Kazuo Nemoto

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02/07/2005

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EXAMINER

VO, HUYEN X

ART UNIT

PAPER NUMBER

2655

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,122

Applicant(s)

NEMOTO, KAZUO

Examiner

Huyen Vo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Response to Arguments***

1. Applicant's arguments filed 9/29/2004 have been fully considered but they are not persuasive. As per claims 1-36, the applicant argues to traverse the art rejection based on the limitations "*correspondence information, said correspondence information storing a correspondence between recognized words and a plurality of speech element arrays expressing pronunciation of said recognized words*" (page 13) and "*a pronunciation prediction probability corresponding to said one of said plurality of speech element arrays is lowered, said pronunciation prediction probability being different from said generated speech element array*" (page 14). However, the examiner interpreted that the correspondence information is the device memory, storing speech recognition models and word dictionary that are essential components of a speech recognition system. The speech element arrays are interpreted as the speech recognition models. During speech recognition, speech features or speech element arrays representing speech command are received by the speech recognition system, which performs similarity analysis by comparing the received speech features with the stored speech models/speech element arrays to determine possible matches. Therefore, Rigazio fully anticipates this limitation. Regarding the second limitation mention above, Nitta teaches a process of measuring the similarity between the received speech features and the stored models to determine a possible match. The probability is a measure in logarithm

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(well known in the art). Thus, the lower in logarithmic probability, the higher chance there is a correct match.

2. The applicant also asserted *"Applicant's invention reflects the Applicant's recognition that the same person can be apt to maintain the same reading in the same conversation. For example, a person who, in one reading, pronounced '00' as 'double zero' is more likely to pronounce 'double zero' consistently in subsequent readings during a conversation or other speech recognition event. By utilizing this tendency, subsequent recognitions can be improved since the fact that a recognized word will be repeated allows for reduced comparisons of speech element arrays. Thus, for the speaker who already has pronounced '00' as 'double zero', the system recognizes subsequent reading of 'double zero' at the time each is rendered. Accordingly, it further follows that a pronunciation prediction probability corresponding to one of a plurality of speech element arrays is lowered with Applicant's invention"* (page 12). However, the claimed subject matters does not include the above limitation in that a user's past speaking behavior/habit is used to predict subsequent readings to improve speech recognition accuracy.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

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be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-4, 15, 17-18, 29-30, and 32-33 are rejected under 35 U.S.C.

103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in

view of Nitta (US Patent No. 5133012).

5. Regarding claim 1, Rigazio et al. disclose a speech recognition system comprising: correspondence information, said correspondence information storing a correspondence between recognized words and a plurality of speech element arrays expressing pronunciation of said recognized words (*col. 3, ln. 39-56, the templates obtained from the training phase*); said speech recognition system recognizing a recognizable word from a received user spoken utterance by comparing a speech element array generated from said user spoken utterance with said plurality of speech element arrays in said correspondence information (*col. 3, ln. 39-56*); wherein, in a dialog of a single person occurring within a certain period of time (*col. 10, ln 25-42*), said generated speech element array corresponds to one of said plurality of speech element arrays (*col. 3, ln. 39-56*).

Rigazio et al. do not disclose that a pronunciation prediction probability corresponding to said one of said plurality of speech element arrays is lowered, said pronunciation prediction probability being different from said generated speech element array. However, Nitta teaches that a pronunciation prediction

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probability corresponding to said one of said plurality of speech element arrays is lowered, said pronunciation prediction probability being different from said generated speech element array (*col. 8, ln. 1-67, prediction probability is lower to reduce erroneous recognition, which is the same as the process of measuring the probability of similarities of segments to determine and reduce misrecognition*).

Since Rigazio et al. and Nitta are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Rigazio et al. by incorporating the teaching of Nitta in order to reduce erroneous recognition to enhance the speech recognition system.

6. Regarding claims 15, 29, and 30, Rigazio et al. disclose a speech recognition method for use within a dialog of a single person, the dialog occurring in a certain period of time and a machine readable storage, having stored thereon a computer program having a plurality of code sections executable by a machine for causing the machine to perform the steps of: receiving a first user spoken utterance and generating a first speech element array from said first user spoken utterance (*col. 3, ln. 39-56 or figure 1*); searching correspondence information, said correspondence information associating recognizable words with a plurality of speech element arrays expressing pronunciation of said recognizable words (*col. 3, ln. 39-56, the templates obtained from the training phase*); generating a first recognized word by comparing said first speech

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element array and said plurality of speech element arrays in said correspondence information (*col. 3, ln. 39-56*); one of a plurality of speech element arrays is made to correspond to the first speech element array (*col. 3, ln. 39-56*); receiving a second user spoken utterance and generating a second speech element array from said second user spoken utterance (*col. 3, ln. 39-56 or figure 1, since it is a dialog system, many users use the system at the same or different time*); searching said correspondence information comprising said lowered pronunciation prediction probability (*col. 3, ln. 39-56, determine and select the closest match is lowering the pronunciation prediction probability*); and generating a second recognized word by comparing said second speech element array and said plurality of speech element arrays in said correspondence information (*col. 3, ln. 39-56*).

Rigazio et al. do not disclose that lowering a pronunciation prediction probability of one of said plurality of speech element arrays, which differs from said first speech element array. However, Nitta teaches that lowering a pronunciation prediction probability of one of said plurality of speech element arrays, which differs from said first speech element array (*col. 8, ln. 1-67, prediction probability is lower to reduce erroneous recognition, which is the same as the process of measuring the probability of similarities of segments to determine and reduce misrecognition*).

Since Rigazio et al. and Nitta are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Rigazio et al. by incorporating the teaching

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of Nitta in order to reduce erroneous recognition to enhance the speech recognition system.

7. Regarding claims 3-4, 17-18, and 32-33, Rigazio et al. further disclose that a certain period of time is a period of time for a continued dialog and a certain period of time is a period of time including a plurality of dialogs in one day (*col. 10, ln. 25-42, a dialog system supporting a number of users at the same or different time for a certain period of time*).

8. Claims 2, 16, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 1, 15, and 30 above, and further in view of Bulfer (US Patent No. 6208966).

9. Regarding claims 2, 16, and 31, Rigazio et al. do not disclose that different speech element arrays expressing pronunciation for a single recognized word include a number corresponding to a previously measured pronunciation prediction probability and a recognized word corresponding to said previously measured pronunciation prediction probability. However, Bulfer teaches that different speech element arrays expressing pronunciation for a single recognized word include a number corresponding to a previously measured pronunciation prediction probability and a recognized word corresponding to said previously

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measured pronunciation prediction probability (*col. 4, ln. 57 to col. 5, ln. 8, "oh" and "zero" express pronunciation for the number zero*).

Since Rigazio et al. and Bulfer are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Rigazio et al. by incorporating the teaching of Bulfer in order to enable the speech recognition system to recognize a wider range of input.

10. Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 2 and 16 above, respectively, further in view of Bulfer (US Patent No. 6208966), and further in view of Huang et al. (US Patent No. 5829000).

11. Regarding claims 6 and 20, Rigazio et al. do not disclose that a means for detecting erroneously recognized words by referring a speaker to at least a part of said recognized words; and means for replacing one of said erroneously recognized words with a recognizable word which can be recognized as said one of said erroneously recognized words. However, Huang et al. teach that a means for detecting erroneously recognized words by referring a speaker to at least a part of said recognized words (*col. 5, ln. 7 to col. 6, ln. 52*); and means for replacing one of said erroneously recognized words with a recognizable word

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which can be recognized as said one of said erroneously recognized words (5, *ln. 7 to col. 6, ln. 52*).

Since Rigazio et al. and Huang et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Rigazio et al. by incorporating the teaching of Huang et al. in order to reduce erroneous recognition to enhance the speech recognition system.

12. Claims 10, 14, 24, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 6 and 20 above, respectively, further in view of Bulfer (US Patent No. 6208966), and further in view of Huang et al. (US Patent No. 5829000), and further in view of Goudie (US Patent No. 4696042).

13. Regarding claims 10, 14, 24, and 28, the modified Rigazio et al. do not disclose a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system. However, Goudie teaches a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to

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said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system (*col. 23, ln. 8 to col. 24, ln. 67 or referring to figures 14-15*).

Since the modified Rigazio et al. and Goudie are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Rigazio et al. by incorporating the teaching of Goudie in order to control the speech contour to enhance the naturalness and intelligibility of the speech.

14. Claims 8, 12, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 2 and 16 above, respectively, further in view of Bulfer (US Patent No. 6208966), and further in view of Goudie (US Patent No. 4696042).

15. Regarding claims 8, 12, 22, and 26, the modified Rigazio et al. do not disclose a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system. However, Goudie teaches a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously

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recognized word comprising one syllable with a short vowel corresponding to said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system (*col. 23, ln. 8 to col. 24, ln. 67 or referring to figures 14-15*).

Since the modified Rigazio et al. and Goudie are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Rigazio et al. by incorporating the teaching of Goudie in order to control the speech contour to enhance the naturalness and intelligibility of the speech.

16. Claims 5, 19, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 1, 15, and 30 above, respectively, and further in view of Huang et al. (US Patent No. 5829000).

17. Regarding claims 5, 19, and 34, Rigazio et al. do not disclose that a means for detecting erroneously recognized words by referring a speaker to at least a part of said recognized words; and means for replacing one of said erroneously recognized words with a recognizable word which can be recognized as said one of said erroneously recognized words. However, Huang et al. teach that a means for detecting erroneously recognized words by referring a speaker to at least a part of said recognized words (*col. 5, ln. 7 to col. 6, ln. 52*); and means for replacing one of said erroneously recognized words with a

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recognizable word which can be recognized as said one of said erroneously recognized words (5, *ln. 7 to col. 6, ln. 52*).

Since Rigazio et al. and Huang et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Rigazio et al. by incorporating the teaching of Huang et al. in order to reduce erroneous recognition to enhance the speech recognition system.

18. Claims 9, 13, 23, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 5 and 19 above, respectively, further in view of Huang et al. (US Patent No. 5829000), and further in view of Goudie (US Patent No. 4696042).

19. Regarding claims 9, 13, 23, and 27, the modified Rigazio et al. do not disclose a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system. However, Goudie teaches a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to

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said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system (*col. 23, ln. 8 to col. 24, ln. 67 or referring to figures 14-15*).

Since the modified Rigazio et al. and Goudie are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Rigazio et al. by incorporating the teaching of Goudie in order to control the speech contour to enhance the naturalness and intelligibility of the speech.

20. Claims 7, 11, 21, 25, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigazio et al. (US Patent No. 6182039) in view of Nitta (US Patent No. 5133012) as applied to claims 1, 15, and 30 above, respectively, and further in view of Goudie (US Patent No. 4696042).

21. Regarding claims 7, 11, 21, 25, and 35-36, the modified Rigazio et al. do not disclose a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system. However, Goudie teaches a means for replacing a recognized word which corresponds to a speech element comprising one syllable with a long vowel with a previously recognized word comprising one syllable with a short vowel corresponding to

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said long vowel, when a number of recognized words does not conform to a previously registered number in said speech recognition system (*col. 23, ln. 8 to col. 24, ln. 67 or referring to figures 14-14*).

Since the modified Rigazio et al. and Goudie are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Rigazio et al. by incorporating the teaching of Goudie in order to control the speech contour to enhance the naturalness and intelligibility of the speech.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo

January 31, 2005


SUSAN MCFADDEN
PRIMARY EXAMINER